

**REMARKS**

Claims 20-48 are pending in this application. Claims 1-19 have been canceled without prejudice or disclaimer. New claims 20-48 have been added herein.

**Support for Amendments**

In new claim 20, the “microorganism-produced polymer” in original claim 1 is limited to “a cohesive or adhesive polysaccharide produced from bacteria of the genus *Zoogloea*; a levan produced from bacteria of the genus *Bacillus*, *Acetobacter*, or *Pseudomonas*; or a polymer containing a sugar component in which fructofuranosyl group(s) is/are bonded to a fructosyl group at the  $\beta$ -2,6 position”, based on the specification , page 14, line 21 to page 15, line 5.

In new claim 21, the “microorganism-produced polymer” in original claim 1 is limited to “a polyamino acid”, based on the description in the specification, page 14, line 21 to page 15, line 5.

New claims 22 to 24 correspond to original claims 3 to 5, respectively.

New claims 25 and 26 correspond to original claim 6.

New claims 27 and 28 correspond to original claim 7.

New claims 29 and 30 correspond to original claim 8.

New claims 31 and 32 correspond to original claim 9.

In new claim 33, the “microorganism-produced polymer” in original claim 10 is limited to “a cohesive or adhesive polysaccharide produced from bacteria of the genus *Zoogloea*; a levan produced from bacteria of the genus *Bacillus*, *Acetobacter*, or *Pseudomonas* or a polymer containing

a sugar component in which fructofuranosyl group(s) is/are bonded to a fructosyl group at the  $\beta$ -2,6 position", based on the specification, page 14, line 21 to page 15, line 5.

In new claim 34, the "microorganism-produced polymer" in original claim 10 is limited to "a polyamino acid", based on the specification, page 14, line 21 to page 15, line 5.

New claims 35 and 36 correspond to original claims 14 and 15, respectively.

New claims 37 and 38 correspond to original claim 11.

New claims 39 and 40 correspond to original claim 12.

New claims 41 and 42 correspond to original claim 16.

New claims 43 and 44 correspond to original claim 17.

New claims 45 and 46 correspond to original claim 18.

New claims 47 and 48 correspond to original claim 19.

### **Characteristics of the Present Invention**

Applicant submits that the present invention has the following characteristics:

(i) The microorganisms retain high growth rate even in the presence of a high concentration of a pollutant, and exhibit their biological activities necessary for assimilation or degradation of the pollutant (the specification, page 4, lines 13-20 and page 21, lines 10-17).

(ii) The pollutant can be concentrated efficiently (the specification, page 4, lines 20-23, and page 21, lines 17-22).

Owing to advantages (i) and (ii), the present invention achieves the excellent affect that the pollutant can be efficiently assimilated or degraded (specification, page 4, line 24, to page 4, line 6, and page 21, lines 10-22).

Examples 3 and 4 in the specification demonstrate the excellent effect. The effect is achieved by using the specific microorganism-produced polymers defined in claims 20, 21, 33 and 34.

#### Rejections under 35 U.S.C. §112

*Claims 1-9 and 16-19 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.*

Claims 1-19 are indefinite because it is not clear what positively recited method steps cover the metes and bounds of the claim.

Applicant herein cancels claims 1-19, and replaces them with claims 20-48. Applicant submits that the new claims overcome the rejections under 35 U.S.C. §112.

#### Rejections under 35 U.S.C. §102

*Claims 10, 16 and 17 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,954,443 to Yamada et al.*

The Examiner asserts that Yamada et al. discloses immobilization of microorganisms in a xanthan gum, which is a microorganism-produced product.

Applicant herein cancels claims 1-19, and replaces them with claims 20-48. Applicant submit that the new claims overcome the rejections under 35 U.S.C. §102. Applicant further submits remarks as detailed hereinbelow.

Applicants respectfully submit that the present amendments overcome this rejection, because Yamada et al. merely discloses microorganisms immobilized in a xanthan gum or its derivative, and does not teach the additional limitations of the presently claimed invention.

### **Rejections under 35 U.S.C. §103**

*Claims 1, 6-12 and 16-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 4,971,66 to Weber et al. in view of Yamada et al.*

Applicant respectfully disagrees with the rejection, in light of the present amendments. Applicant herein cancels claims 1-19, and replaces them with claims 20-48. Applicant submit that the new claims overcome the rejections under 35 U.S.C. §103. Applicant further submits remarks as detailed hereinbelow.

#### **Yamada et al.**

Applicants note that Yamada et al. simply discloses an easy and economic technique for the general idea of immobilizing microorganisms in a xanthan gum or its derivative, and nowhere teaches the specific microorganism-produced polymers for use in the present invention.

Moreover, Yamada et al. does not teach or suggest the advantages achieved by the present invention, nor the need or desirability of achieving the advantages of the present invention.

#### **Weber et al.**

Applicants note that Weber et al. discloses a process for the purification of waste waters using microorganisms immobilized in a gel-type organic polymer that does not denature the microorganisms (e.g., Example 1), and shows alginic acid, carrageenan and chitosan as specific examples of the organic polymer (col. 2, lines 30-58).

However, Weber et al. discloses nothing about the specific microorganism-produced polymers used in the present invention.

Moreover, the effects of the present invention cannot be achieved by using the gel-type organic polymer disclosed in Weber et al. in place of the specific polymer used in the present invention. This matter is demonstrated in the enclosed Declaration.

As is apparent from the above, neither Yamada et al. nor Weber et al. discloses the specific microorganism-produced polymers used in the present invention. Further, neither Yamada et al. nor Weber et al. teaches or suggests the excellent effect accomplished by the present invention. Accordingly, Applicant submits that the present invention is patentable over Weber et al. in view of Yamada et al.

*Claims 2-5 and 13-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 4,971,698 to Weber et al. in view of Yamada et al. as applied to claims 1, 6-12 and 16-19 above, and further in view of U.S. Patent 5,700,848 to Soon-Shiong et al.*

Applicant respectfully disagrees with the rejection, in light of the present amendments.

With reference to Soon-Shiong et al., Applicant notes that it merely discloses a list of biocompatible polymers (col. 6, line 51 to col. 7, line 6), and does not teach polymers usable in a microbial treatment agent for treating an environment pollutant.

Furthermore, the organic polymer used in Yamada et al. or Weber et al. for immobilizing microorganisms is a polysaccharide, which is totally different from a polyamino acid.

Therefore, there would have been no suggestion or motivation to employ a polyamino acid disclosed in Soon-Shiong et al. in place of the organic polymer used in Yamada et al. or Weber et al. for immobilizing microorganisms.

Therefore, Applicant submits that the present invention is patentable over Yamada et al. in view of Weber et al. and further in view of Soon-Shiong et al.

For at least the above reasons, Applicant submits that the claims, as herein amended, are in condition for allowance. Applicant earnestly requests withdrawal of the rejections and passage of the claims to issue.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Amendment under 37 C.F.R. §1.111  
Akihito TSUCHIYA

U.S. Patent Application Serial No. 09/731,863  
Attorney Docket No. 001611

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees that may be due with respect to this paper to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Declaration under 37 C.F.R. 1.132

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